

REMARKS

The Examiner has rejected claims 1, 2, 5, 7-9, 12, 14, 15, 17, 18, 20-22 and 25 under § 102(e) as being anticipated by Reid et al. U.S. Patent No. 6,958,123. Claims 6, 10, 11, 19, 23 and 24 are rejected under § 103(a) as being unpatentable over Reid et al. in view of Bhanap et al. U.S. Patent Application Publication No. 2005/0095840. Claims 13 and 26 are rejected under § 103(a) as being unpatentable over Reid et al. in view of Sieber et al. U.S. Patent Application Publication No. 2005/0176230.

With all due respect, Examiner has misinterpreted the Reid et al. patent, and once again, has picked and chosen portions of a reference, divorced the portions from their context, and then pieced the portions together in an attempt to defeat patentability. This is not permitted. The Reid et al. patent discloses the use of a sacrificial layer 2, 14 on a substrate 1, 10 (or on a block layer 12 on substrate 10) upon which a micromechanical device is formed. The micromechanical device includes a first layer 7,18 (amorphous silicon, polysilicon, SiC, SiN or SiO₂) on sacrificial layer 2, 14; a hinge layer 8, 20 on first layer 7, 18; and a metal reflective and conductive layer 8, 22 on hinge layer 8, 20. After the MEMS device (7,8,9 or 18,20,22) is formed on the sacrificial layer 2,14, the sacrificial layer 2,14 is sacrificed, i.e., completely removed, thereby releasing the device from the substrate 1, 10 so it is free to move.

The sacrificial layer 2,14 can be a fluorocarbon polymer, including a low-k (dielectric) material. Supercritical fluid and solvents are used for several reasons as described by Reid et al. First, a supercritical fluid and solvent may be used to deposit the sacrificial layer. For example, the polymer is dissolved in the supercritical fluid and solvent, and then spin-coated onto the substrate to form the sacrificial film. RESS processes and CVD process can also be used to deposit the sacrificial fluorocarbon material onto the substrate. Second, a supercritical fluid and solvent may be used to pattern the sacrificial layer 2,14 to remove portions thereof by dissolving the portions of the sacrificial layer, i.e., the fluorocarbon polymer. Third, a supercritical fluid and solvent may be used to remove the sacrificial layer 2,14 completely to

release the MEMS device. Thus, in the Reid et al. patent, supercritical fluids and solvents are used to deposit a fluorocarbon material, and to remove a fluorocarbon material by dissolving it. Reid et al. do not disclose a fluorocarbon dielectric film having an exposed surface with contaminants on the exposed surface, and treating the exposed surface with supercritical carbon dioxide fluid to clean the contaminants from the exposed surface and to provide surface termination on the exposed surface, as claimed. Reid et al. do not disclose a cleaning process for the fluorocarbon layer. To the contrary, Reid et al.'s process does not leave in place the fluorocarbon layer, but instead, removes it completely as a sacrificial layer. There can be no surface termination of an exposed surface of a layer where the layer is completely removed.

In paragraph 2 of Examiners Action, Examiner cites Col. 6, lines 5-17 of the Reid et al. patent as teaching the claim element of "treating the exposed surface with a supercritical carbon dioxide fluid to clean the exposed surface of the contaminants and provide surface termination." However, that passage of Reid et al. describes the use of supercritical fluid and/or a solvent for dissolving the polymer to deposit the polymer on the substrate to form the sacrificial layer. Thus, the passage is taken out of context by the Examiner, and does not teach the claim element, as alleged.

In paragraphs 3, 5, 10 and 20 of Examiners Action, Examiner cites Col. 4, lines 23-32 of the Reid et al. patent as teaching the claim 2 and claim 15 element of "wherein the contaminants comprise CH_x, H₂O, OH, or HF, or a combination of two or more thereof" and the claim 7 and claim 20 element of "wherein the surface termination comprises C-F functional groups or Si-Me₃ functional groups." However, that passage of Reid et al. describes the use of chemical etchants containing C with F and/or H to etch the first layer 7,18 and/or hinge layer 8, 20, which reside on the sacrificial layer 2,14. There is no teaching in this passage that the particular compounds recited in claim 2 reside as contaminants on an exposed surface of the fluorocarbon layer (sacrificial layer 2,14), which contaminants are then removed by supercritical carbon dioxide, nor is there any teaching that the chemical etchants provide C-F or Si-Me₃.

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surface termination of the exposed surface of the fluorocarbon layer. Again, the cited passage is taken out of context by the Examiner, and does not teach the claim elements, as alleged.

In paragraphs 6 and 14 of Examiners Action, Examiner cites Col. 15, line 49 to Col. 16, line 5 and Col. 16, lines 33-56 of the Reid et al. patent as teaching the claim 8 and claim 21 element of " performing a first treatment wherein the supercritical carbon dioxide fluid contains the alcohol solvent; and performing a second treatment wherein the supercritical carbon dioxide fluid contains the silicon-containing chemical solvent." The first passage cited by Examiner discloses the use of various alcohols as a cosolvent with the supercritical fluid for use in depositing, patterning or removing completely the sacrificial layer (e.g., fluorocarbon layer). The second passage cited by Examiner discloses the use of a silane gas, optionally with supercritical carbon dioxide, for applying an anti-stiction layer to the MEMS device after releasing the device, i.e., after removing the sacrificial fluorocarbon layer. Therefore, it does not teach a second treatment step of the fluorocarbon layer. Nowhere in the Reid et al. patent is there any teaching a two-step treatment process of an exposed surface of a fluorocarbon dielectric layer, first with supercritical carbon dioxide and alcohol, and second with supercritical carbon dioxide and a silicon-containing solvent. Again, the cited passages are taken out of context by the Examiner, and do not teach the claim element, as alleged.

In paragraphs 8 and 16 of Examiners Action, Examiner cites Figure 1D, reference 1D of the Reid et al. patent as teaching the claim 12 and claim 25 element of " depositing a metal-containing film onto the treated surface of the fluoro-carbon film, wherein the surface termination improves adhesion of the metal-containing film to the fluoro-carbon film." However, reference 22 of Reid et al. refers to the metal reflective and conductive layer 22, which resides on hinge layer 20, which resides partially on first layer 18 and partially on fluorocarbon layer 14. So, not only does Reid et al. not teach treating an exposed surface of fluorocarbon layer 14, they also do not further teach depositing metal-containing layer 22 on a treated exposed surface of fluorocarbon layer 14. Also, Reid et al. would not want to provide increase adhesion to

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the fluorocarbon layer 14 because that is a sacrificial layer that they seek to completely remove after the subsequent layers are formed thereon. Examiner has taken reference 22 out of context, as it does not support the teaching for which Examiner relies.

In paragraph 9 of Examiners Action, Examiner cites Col. 15, lines 23-43 of the Reid et al. patent as teaching the claim element of "treating the exposed surface with a supercritical carbon dioxide fluid and a solvent to clean the exposed surface of the contaminants and provide surface termination." However, that passage of Reid et al. simply describes the use of a solvent with a supercritical fluid to increase solubilities of compounds in the supercritical carbon dioxide. The solubility of compounds, considered in proper context, relates to dissolving the polymer in the supercritical fluid and solvent for the purpose of depositing the polymer on the substrate to form the sacrificial layer, patterning the sacrificial layer, and/or completely removing the sacrificial layer. Thus, yet again, the passage is taken out of context by the Examiner, and does not teach the claim element, as alleged.

As done previously with Sieber et al., Examiner has merely picked parts of the disclosure of Reid et al. and pieced them together in an attempt to support the rejections under §§ 102 and 103 without regard to their context. Reid et al., when read as a whole and in context, simply does not teach each and every element of the claimed method. It is firmly established that it is not permissible to pick and choose only so much of any given reference as will support a given position and ignore the reference in its totality. The context of the disclosure must be considered. Examiner has simply found that Reid et al. disclose using supercritical fluid and a solvent for "something" related to a fluorocarbon film, and then concludes that the "something" is a treating of an exposed surface of the fluorocarbon film to remove contaminants from that surface and to provide surface termination. A careful review of the reference, however, will reveal that Examiner's conclusion is completely unfounded, and based upon picking and choosing parts of the reference, stripping the parts of their context, and then putting them together in a manner that bears no resemblance to the actual disclosure of the reference to attempt

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to defeat patentability. This cannot stand. Applicants thus respectfully request withdrawal of all rejections of claims 1, 2, 5-15 and 17-26 over Reid et al., alone or in combination with Bhanap et al. or Sieber et al.

Further, with respect to the combination of Reid et al. with Bhanap et al., Examiner alleges that Bhanap et al. disclose a silicon containing chemical and a nitrated fluorocarbon film, as claimed in claims 6, 10, 11, 19, 23 and 24. The relevant claims refer to a silicon-containing chemical solvent that is used with the supercritical carbon dioxide to clean contaminants and provide surface termination. The relevant claims also refer to the fluoro-carbon film as being nitrated. Bhanap et al. disclose a silicon-containing chemical that is used in spin-on-coating of a substrate to form a silica dielectric film. Thus, Bhanap et al. are disclosing a precursor for depositing silica, not a solvent for cleaning and surface termination. Thus, one skilled in the art would have no motivation based on Reid et al. and Bhanap et al. to use the silicon-containing chemicals disclosed in Bhanap et al. as a solvent with the supercritical fluid disclosed by Reid et al. Bhanap et al. also disclose a nitrated hydrocarbon solvent, which bears no relation to a nitrated fluoro-carbon dielectric film, as claimed. Again, the disclosures of the reference are taken completely out of context, which is not permissible, and cannot form the basis of an obviousness rejection. For at least these additional reasons, Applicants respectfully request withdrawal of the rejections of claims 6, 8-11, 13, 17, 19, 21, 23 and 24.

With respect to claims 13 and 26, the deficiencies of Sieber et al. are fully set forth in Applicants previous response, and thus, Sieber et al. does not cure the deficiencies of Reid et al., as set forth above. For at least these additional reasons, Applicants respectfully request withdrawal of the rejections of claims 13 and 26.

In view of the remarks given herein, Applicants respectfully believe this case is in condition for allowance and respectfully request allowance of the pending claims. If the Examiner believes any detailed language of the claims requires further discussion, the Examiner

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is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved. The Examiner's prompt attention to this matter is appreciated.

Applicants are of the opinion that no additional fee is due as a result of this Amendment. Applicants are also of the opinion that a two-month extension of time is due with this Amendment. Payment of all charges due for this filing is made on the attached Electronic Fee Sheet. If any additional charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

Respectfully submitted,

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